V 300 S / VS 300 S

EN

Installation and operating instructions

CE 0297

7119100007L02

DÜRR DENTAL

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Important information

1 About this document

These installation and operating instructions represent part of the unit.

If the instructions and information in these installation and operating instructions are not followed, Dürr Dental will not be able to offer any warranty or assume any liability for the safe operation and the safe functioning of the unit.

The German version of the installation and operating instructions is the original manual. All other languages are translation of the original manual. These installation and operating instructions apply to:

V 300 S

Order number: 7119-01; 7119-01/002; 7119-02; 7119-02/002

VS 300 S

Order number: 7122-01; 7122-01/002; 7122-01/021; 7122-02; 7122-02/002; 7122-03; 7122-03/002; 7122-04; 7122-04/002; 7122-05/003

1.1 Warnings and symbols

Warnings

The warnings in this document are intended to draw your attention to possible injury to persons or damage to machinery.

The following warning symbols are used:


General warning symbol


Warning – dangerous high voltage


Warning – hot surfaces


Warning - automatic start-up of the unit


Biohazard warning

The warnings are structured as follows:

SIGNAL WORD

Description of the type and source of danger

Here you will find the possible consequences of ignoring the warning

› Follow these measures to avoid the danger.

The signal word differentiates between four levels of danger:

- **DANGER**
  Immediate danger of severe injury or death
- **WARNING**
  Possible danger of severe injury or death
- **CAUTION**
  Risk of minor injuries
- **NOTICE**
  Risk of extensive material/property damage

Other symbols

These symbols are used in the document and on or in the unit:

Note, e.g. specific instructions regarding efficient and cost-effective use of the unit.


Refer to Operating Instructions.


Wear protective gloves.


Disconnect all power from the unit.


Refer to the accompanying electronic documents.

Lower and upper temperature limits

Lower and upper humidity limits


Protective ground connection

CE xxxx CE labelling with the number of the notified body

SN Serial number

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REF Order number

MD Medical device

HIBC Health Industry Bar Code (HIBC)

 Manufacturer

1.2 Copyright information

2 Safety

Dürr Dental has designed and constructed this unit so that when used properly and for the intended purpose it does not pose any danger to people or property.
Despite this, the following residual risks can remain:

- Personal injury due to incorrect use/misuse
- Personal injury due to mechanical effects
- Personal injury due to electric shock
- Personal injury due to radiation
- Personal injury due to fire
- Personal injury due to thermal effects on skin
- Personal injury due to lack of hygiene, e.g. infection

2.1 Intended purpose

The suction unit provides the dental treatment unit with vacuum and volume flow.

2.2 Intended use

Working in combination with the suction unit with treatment unit, suction handpiece and cannula, the media used in dental treatment (e.g. water, saliva, dentine and amalgam) are removed by suction for disposal.
This unit is technically suitable for the aspiration of nitrous oxide (laughing gas). However, when assembling a system for aspiration of nitrous oxide, it is important to ensure that the other components in the system are also suitable for this purpose. Those responsible for setting up the system must assess this and approve and release the system for the aspiration of nitrous oxide.

Operation with nitrous oxide is only permitted if the exhaust air is transported from the unit to the outside of the building.

2.3 Improper use

Any use of this appliance / these appliances above and beyond that described in the Installation and Operating Instructions is deemed to be incorrect usage. The manufacturer cannot be held liable for any damage resulting from incorrect usage. The operator will be held liable and bears all risks.

› Do not use this device to aspirate flammable or explosive mixtures.

- The unit must not be used as a vacuum cleaner.
- Do not use chemicals containing chlorine or foaming chemicals.
- Operation in operating theatres of explosive areas is not permissible.

2.4 Systems, connection with other devices

Additional devices connected with medical electrical devices must be proven to conform with their corresponding IEC or ISO standards. All configurations must continue to comply with the standard requirements for medical systems (see IEC 60601-1).
Whoever connects additional devices to medical electrical devices automatically becomes the system configurator and is responsible for ensuring that the system corresponds with the standard requirements for systems. Local laws take priority over the requirements outlined above.

2.5 General safety information

- Always comply with the specifications of all guidelines, laws, and other rules and regulations applicable at the site of operation for the operation of this unit.
- Check the function and condition of the unit prior to every use.
- Do not convert or modify the unit.
- Comply with the specifications of the Installation and Operating Instructions.
- The Installation and Operating Instructions must be accessible to all operators of the unit at all times.

2.6 Specialist personnel

Operation

Unit operating personnel must ensure safe and correct handling based on their training and knowledge.

- Instruct or have every user instructed in handling the unit.

Installation and repairs

- Installation, readjustments, alterations, upgrades and repairs must be carried out by Dürr Dental or by qualified personnel specifically approved and authorized by Dürr Dental.

2.7 Notification requirement of serious incidents

The operator/patient is required to report any serious incident that occurs in connection with the device to the manufacturer and to the competent authority of the Member State in which the operator and/or patient is established/resident.

2.8 Electrical safety

- Comply with all the relevant electrical safety regulations when working on the unit.
- Never touch the patient and unshielded plug connections on the device at the same time.
- Replace any damaged cables or plugs immediately.

Observe the EMC rules concerning medical devices

- The unit is intended for use in professional healthcare facilities (in accordance with IEC 60601-1-2). If the appliance is operated in another environment, potential effects on electromagnetic compatibility must be taken into account.
- Do not operate the unit in the vicinity of HF surgical instruments or MRT equipment.
- Maintain a minimum distance of at least 30 cm between the unit and other electronic devices.
- Note that cable lengths and cable extensions have effects on electromagnetic compatibility.
- No maintenance measures are required to maintain the EMV basic safety.

NOTICE

Negative effects on the EMC due to non-authorised accessories

- Use only Dürr Dental parts or accessories specifically approved by Dürr Dental.
- Using any other accessories may result in increased electromagnetic interference emissions or the unit having reduced electromagnetic immunity, leading to an erroneous operation mode.

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NOTICE

Erroneous operation mode due to use immediately adjacent to other devices or with other stacked devices

› Do not stack the unit together with other devices.
› If this is unavoidable, the unit and other devices should be monitored in order to ensure that they are working correctly.

NOTICE

Reduced performance characteristics due to insufficient distance between unit and portable HF communication devices

› Keep a distance of at least 30 cm between the unit (including parts and cables of the unit) and portable HF communication devices (wireless units) (including their accessories such as antenna cables and external antennas).

2.9 Only use original parts

› Only use accessories and optional items that have been recommended or specifically approved by Dürr Dental.
› Only use only original wear parts and replacement parts.

2.10 Transport

The original packaging provides optimum protection for the unit during transport.
If required, original packaging for the unit can be ordered from Dürr Dental.

Dürr Dental will not accept any responsibility or liability for damage occurring during transport due to the use of incorrect packaging, even where the unit is still under guarantee.

› Only transport the unit in its original packaging.
› Keep the packing materials out of the reach of children.

2.11 Disposal

The unit may be contaminated. Instruct the company disposing of the waste to take the relevant safety precautions.

› Decontaminate potentially contaminated parts before disposing of them.
› Uncontaminated parts (e.g. electronics, plastic and metal parts etc.) should be disposed of in accordance with the local waste disposal regulations.
› If you have any questions about the correct disposal of parts, please contact your dental trade supplier.

An overview of the waste keys for Dürr Dental products can be found in the download area at www.duerrdental.com (document no. P007100155).

Product description

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3 Overview

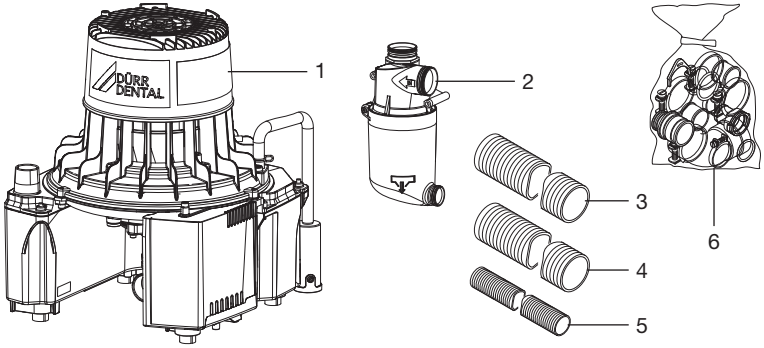

Fig. 1: V 300 S

1 Suction unit
2 Condensation separator
3 Suction hose
4 Exhaust air hose (aluminium)
5 Waste water hose LW 20
6 Set of connection fittings

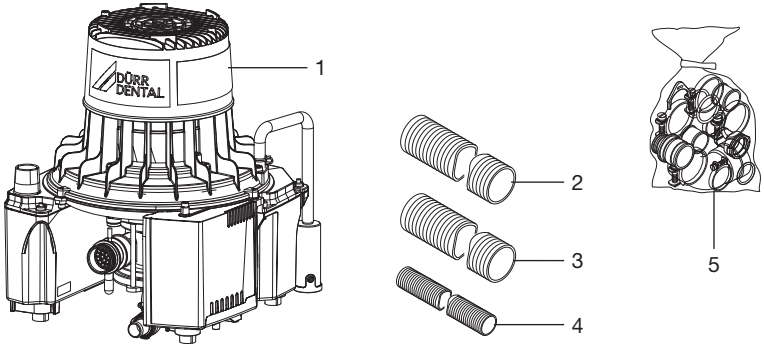

Fig. 2: VS 300 S

1 Combination suction unit
2 Suction hose
3 Exhaust air hose (aluminium)
4 Waste water hose LW 20
5 Set of connection fittings

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3.1 Scope of delivery

The following items are included in the scope of delivery (possible variations due to country-specific requirements and/or import regulations):

V 300 S

V 300 S, 230 V, 1~, 50 Hz 7119-01
V 300 S, 230 V, 1~, 50/60 Hz 7119-02
– Connector set
V 300 S, 230 V, 1~, 50 Hz 7119-01/002
V 300 S, 230 V, 1~, 50/60 Hz 7119-02/002
– Set of connection fittings
– Suction hose LW 30, grey
– Exhaust air hose LW 30, aluminium
– Waste hose LW 20
– Condensation separator

VS 300 S

VS 300 S, 230 V, 1~, 50 Hz 7122-01
VS 300 S, 230 V, 1~, 50/60 Hz 7122-02
VS 300 S, 230 V, 1~, 60 Hz 7122-03
VS 300 S, 230 V, 1~, 50 Hz, with rinsing unit 7122-04
– Connector set
– Protective strainer with connecting parts
VS 300 S, 230 V, 1~, 50 Hz 7122-01/002
VS 300 S, 230 V, 1~, 50/60 Hz . . 7122-02/002
VS 300 S, 230 V, 1~, 60 Hz 7122-03/002
VS 300 S, 230 V, 1~, 50 Hz, with rinsing unit 7122-04/002
VS 300 S, 100 V, 1~, 50/60 Hz . . 7122-05/003
– Set of connection fittings
– Suction hose LW 30, grey
– Exhaust air hose LW 30, aluminium
– Waste water hose LW 20
– Bacteria filter
– OroCup

3.2 Optional items

The following optional items can be used with the device:

V 300 S

Wall bracket 7130-190-00
Noise reduction hood 7122200000
Condensation separator kit for housing 7119-701-20
Bacteria filter with accessories . . . 7120-143-00
Bacteria filter with housing 7120100000
Ventilation kit for cabinet installation 7122-981-51
Console for floor-mounted installation 7130-191-00

VS 300 S

Wall bracket 7130-190-00
Noise reduction hood 7122200000
Bacteria filter with accessories . . . 7120-143-00
Bacteria filter with housing 7120100000
Rinsing unit conversion set for VS 300 S and VSA 300 S 7100-120-53
Rinsing unit II 7100-250-50
Ventilation kit for cabinet installation 7122-981-51
Secretion filter 7123-120-00
Console for floor-mounted installation 7130-191-00

3.3 Consumables

The following materials are consumed during operation of the device and must be ordered separately:
Orotol plus (2.5 litre bottle) CDS110P6150
MD 555 cleaner (2.5 litre bottle) . CCS555C6150

3.4 Wear parts and replacement parts

The following working parts need to be changed at regular intervals (refer to the "Maintenance" section):
Nonreturn valve (pack of 3) 7128-100-03E

Information about replacement parts is available from the portal for authorised specialist dealers at: www.duerrdental.net.

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4 Technical data

4.1 V 300 S

Electrical data		7119-01	7119-02	
Rated voltage	V	230, 1~	230, 1~	
Mains frequency	Hz	50	50	60
Nominal current	A	2.9	2.9	3.7
Starting current, approx.	A	10.4	10.4	9.5
Motor protection		Motor winding overheat protector 160 °C (±5 °C)		
Rated power	W	580	580	800
Type of protection		IP 20		
Protection class		I		
Protective low voltage	V	24 ~		
Output	VA	4		

Connections				
Suction connection, DürrConnect special	mm	∅ 30		
Exhaust air connection (external)	mm	∅ 30		

Media				
Max. number of users		1		
Max. flow rate with unimpeded flow	l/min	700	700	800
Max. suction system pressure *	mbar/hPa	-200		

* Depending on unit type

General data				
Duty cycle	%	100		
Dimensions (H x W x D) *	cm	38 x 31 x 32		
Weight, approx. without housing with housing	 kg kg	 13 21		
Noise level ** approx. without housing with housing	 dB(A) dB(A)	 63 51	 63 51	 65 54

* Values without accessories and add-on parts
** Noise level in accordance with ISO 3746

Ambient conditions during storage and transport		
Temperature	°C	-10 to +60
Relative humidity	%	< 95

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Ambient conditions during operation		
Temperature	°C	+10 to +40
Relative humidity	%	< 70

Classification	
Medical Device Class	IIa

Electromagnetic compatibility (EMC) Interference emission measurements	
High-frequency emissions in accordance with CISPR 11	Group 1 Class B
Interference voltage at the power supply connection CISPR 11:2009+A1:2010	Compliant
Electromagnetic interference radiation CISPR 11:2009+A1:2010	Compliant
Emission of harmonics IEC 61000-3-2:2005+A1:2008+A2:2009	Compliant
Voltage changes, voltage fluctuations and flicker emissions IEC 61000-3-3:2013	Compliant

Electromagnetic compatibility (EMC) Interference immunity measurements	
Immunity to electrostatic discharge IEC 61000-4-2:2008	Compliant
Immunity to high-frequency electromagnetic fields IEC 61000-4-3:2006+A1:2007+A2:2010	Compliant
Immunity to near fields of wireless HF communication devices IEC 61000-4-3:2006+A1:2007+A2:2010	Compliant
Immunity to fast electrical transients/bursts – AC mains voltage IEC 61000-4-4:2012	Compliant
Immunity to electrical fast transients/bursts – I/O, SIP/SOP ports IEC 61000-4-4:2012	Compliant
Immunity to interference, surges IEC 61000-4-5:2005	Compliant
Immunity to conducted disturbances, induced by radio-frequency fields – AC mains voltage IEC 61000-4-6:2013	Compliant
Immunity to conducted disturbances, induced by radio-frequency fields – SIP/SOP ports IEC 61000-4-6:2013	Compliant
Immunity to power frequency magnetic fields IEC 61000-4-8:2009	Compliant

Electromagnetic compatibility (EMC) Interference immunity measurements	
Immunity to voltage dips, short interruptions and voltage variations IEC 61000-4-11:2004	Compliant

Immunity to interference table, near fields of wireless HF communication devices		
Radio service	**Frequency band MHz**	**Test level V/m**
TETRA 400	380 - 390	27
GMRS 460 FRS 460	430 - 470	28
LTE band 13, 17	704 - 787	9
GSM 800/900 TETRA 800 iDEN 820 CDMA 850 LTE band 5	800 - 960	28
GSM 1800 CDMA 1900 GSM 1900 DECT LTE band 1, 3, 4, 25 UMTS	1700 - 1990	28
Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE band 7	2400 - 2570	28
WLAN 802.11 a/n	5100 - 5800	9

Electromagnetic compatibility (EMC) Interference immunity measurements on the supply input	
Immunity to fast electrical transients/bursts – AC mains voltage IEC 61000-4-4:2012 ± 2 kV 100 kHz repetition rate	Compliant
Immunity to surges, line-to-line IEC 61000-4-5:2005 ± 0.5 kV, ± 1 kV	Compliant
Immunity to surges, line-earth IEC 61000-4-5:2005 ± 0.5 kV, ± 1 kV, ± 2 kV	Compliant

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Electromagnetic compatibility (EMC) Interference immunity measurements on the supply input	
Immunity to conducted disturbances, induced by radio-frequency fields – AC mains voltage IEC 61000-4-6:2013 3 V 0.15–80 MHz 6 V ISM frequency bands 0.15–80 MHz 80% AM at 1 kHz	Compliant
Immunity to voltage dips, short interruptions and voltage variations IEC 61000-4-11:2004	Compliant
Electromagnetic compatibility (EMC) Interference immunity measurements SIP/SOP	
Immunity to electrostatic discharge IEC 61000-4-2:2008 ± 8 kV contact ± 2kV, ± 4 kV, ± 8 kV, ± 15 kV air	Compliant
Immunity to electrical fast transients/bursts – I/O, SIP/SOP ports IEC 61000-4-4:2012 ± 1 kV 100 kHz repetition rate	Compliant
Immunity to impulse voltages, conductor to earth IEC 61000-4-5:2005 ± 2 kV	
Immunity to conducted disturbances, induced by radio-frequency fields – SIP/SOP ports IEC 61000-4-6:2013 3 V 0.15–80 MHz 6 V ISM frequency bands 0.15–80 MHz 80% AM at 1 kHz	Compliant

4.2 VS 300 S

Electrical data		7122-01 7122-04	7122-02		7122-03
Rated voltage	V	230, 1~	230, 1~		230, 1~
Mains frequency	Hz	50	50	60	60
Nominal current	A	2.9	2.9	3.7	3.7
Starting current, approx.	A	10.4	10.4	9.5	9.5
Motor protection		Motor winding overheat protector 160 °C (±5 °C)			
Rated power	W	580	580	800	800
Type of protection		IP 20			
Protection class		I			
Protective low voltage	V	24 ~			
Output	VA	4			

Connections					
Suction connection, DürrConnect special	mm	∅ 30			
Exhaust air connection (external)	mm	∅ 30			
Drain connection, DürrConnect	mm	∅ 20			

Media					
Max. unimpeded flow rate	l/min	700	700	800	800
Max. suction system pressure *	mbar/hPa	-200			
Max. rate of flow of fluids	l/min	4			
Max. suction height	cm	50			

* Depending on unit type

General data					
Duty cycle	%	100			
Dimensions (H x W x D) *	cm	38 x 31 x 32			
Weight, approx. without housing with housing	 kg kg	 13.5 21.5			
Noise level ** approx. without housing with housing	 dB(A) dB(A)	 63 51	 63 51	 65 54	 65 54

* Values without accessories and add-on parts
** Noise level in accordance with ISO 3746

Ambient conditions during storage and transport		
Temperature	°C	-10 to +60

Ambient conditions during storage and transport		
Relative humidity	%	< 95
Ambient conditions during operation		
Temperature	°C	+10 to +40
Relative humidity	%	< 70
Classification		
Medical Device Class		IIa
Electromagnetic compatibility (EMC) Interference emission measurements		
High-frequency emissions in accordance with CISPR 11		Group 1 Class B
Interference voltage at the power supply connection CISPR 11:2009+A1:2010		Compliant
Electromagnetic interference radiation CISPR 11:2009+A1:2010		Compliant
Emission of harmonics IEC 61000-3-2:2005+A1:2008+A2:2009		Compliant
Voltage changes, voltage fluctuations and flicker emissions IEC 61000-3-3:2013		Compliant
Electromagnetic compatibility (EMC) Interference immunity measurements		
Immunity to electrostatic discharge IEC 61000-4-2:2008		Compliant
Immunity to high-frequency electromagnetic fields IEC 61000-4-3:2006+A1:2007+A2:2010		Compliant
Immunity to near fields of wireless HF communication devices IEC 61000-4-3:2006+A1:2007+A2:2010		Compliant
Immunity to fast electrical transients/bursts – AC mains voltage IEC 61000-4-4:2012		Compliant
Immunity to electrical fast transients/bursts – I/O, SIP/SOP ports IEC 61000-4-4:2012		Compliant
Immunity to interference, surges IEC 61000-4-5:2005		Compliant
Immunity to conducted disturbances, induced by radio-frequency fields – AC mains voltage IEC 61000-4-6:2013		Compliant

Electromagnetic compatibility (EMC) Interference immunity measurements	
Immunity to conducted disturbances, induced by radio-frequency fields – SIP/SOP ports IEC 61000-4-6:2013	Compliant
Immunity to power frequency magnetic fields IEC 61000-4-8:2009	Compliant
Immunity to voltage dips, short interruptions and voltage variations IEC 61000-4-11:2004	Compliant

Immunity to interference table, near fields of wireless HF communication devices		
Radio service	**Frequency band MHz**	**Test level V/m**
TETRA 400	380 - 390	27
GMRS 460 FRS 460	430 - 470	28
LTE band 13, 17	704 - 787	9
GSM 800/900 TETRA 800 iDEN 820 CDMA 850 LTE band 5	800 - 960	28
GSM 1800 CDMA 1900 GSM 1900 DECT LTE band 1, 3, 4, 25 UMTS	1700 - 1990	28
Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE band 7	2400 - 2570	28
WLAN 802.11 a/n	5100 - 5800	9

Electromagnetic compatibility (EMC) Interference immunity measurements on the supply input	
Immunity to fast electrical transients/bursts – AC mains voltage IEC 61000-4-4:2012 ± 2 kV 100 kHz repetition rate	Compliant
Immunity to surges, line-to-line IEC 61000-4-5:2005 ± 0.5 kV, ± 1 kV	Compliant
Immunity to surges, line-earth IEC 61000-4-5:2005 ± 0.5 kV, ± 1 kV, ± 2 kV	Compliant

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Electromagnetic compatibility (EMC) Interference immunity measurements on the supply input	
Immunity to conducted disturbances, induced by radio-frequency fields – AC mains voltage IEC 61000-4-6:2013 3 V 0.15–80 MHz 6 V ISM frequency bands 0.15–80 MHz 80% AM at 1 kHz	Compliant
Immunity to voltage dips, short interruptions and voltage variations IEC 61000-4-11:2004	Compliant
Electromagnetic compatibility (EMC) Interference immunity measurements SIP/SOP	
Immunity to electrostatic discharge IEC 61000-4-2:2008 ± 8 kV contact ± 2kV, ± 4 kV, ± 8 kV, ± 15 kV air	Compliant
Immunity to electrical fast transients/bursts – I/O, SIP/SOP ports IEC 61000-4-4:2012 ± 1 kV 100 kHz repetition rate	Compliant
Immunity to impulse voltages, conductor to earth IEC 61000-4-5:2005 ± 2 kV	
Immunity to conducted disturbances, induced by radio-frequency fields – SIP/SOP ports IEC 61000-4-6:2013 3 V 0.15–80 MHz 6 V ISM frequency bands 0.15–80 MHz 80% AM at 1 kHz	Compliant

4.3 VS 300 S

Electrical data		7122-05	
Rated voltage	V	100, 1~	
Mains frequency	Hz	50	60
Nominal current	A	8	10
Starting current, approx.	A	21	20.5
Motor protection		Motor winding overheat protector 160 °C (±5 °C)	
Rated power	W	650	850
Type of protection		IP 20	
Protection class		I	
Protective low voltage	V	24 ~	
Output	VA	4	

Connections		
Suction connection, DürrConnect special	mm	∅ 30
Exhaust air connection (external)	mm	∅ 30
Drain connection, DürrConnect	mm	∅ 20

Media			
Max. unimpeded flow rate	l/min	700	800
Max. suction system pressure *	mbar/hPa	-200	
Max. rate of flow of fluids	l/min	4	
Max. suction height	cm	50	

* Depending on unit type

General data			
Duty cycle	%	100	
Dimensions (H x W x D) *	cm	38 x 31 x 32	
Weight, approx. without housing with housing	 kg kg	 13.5 21.5	
Noise level ** approx. without housing with housing	 dB(A) dB(A)	 63 51	 65 54

* Values without accessories and add-on parts
** Noise level in accordance with ISO 3746

Ambient conditions during storage and transport		
Temperature	°C	-10 to +60
Relative humidity	%	< 95

EN

Ambient conditions during operation		
Temperature	°C	+10 to +40
Relative humidity	%	< 70

Classification	
Medical Device Class	IIa

Electromagnetic compatibility (EMC) Interference emission measurements	
High-frequency emissions in accordance with CISPR 11	Group 1 Class B
Interference voltage at the power supply connection CISPR 11:2009+A1:2010	Compliant
Electromagnetic interference radiation CISPR 11:2009+A1:2010	Compliant
Emission of harmonics IEC 61000-3-2:2005+A1:2008+A2:2009	Compliant
Voltage changes, voltage fluctuations and flicker emissions IEC 61000-3-3:2013	Compliant

Electromagnetic compatibility (EMC) Interference immunity measurements	
Immunity to electrostatic discharge IEC 61000-4-2:2008	Compliant
Immunity to high-frequency electromagnetic fields IEC 61000-4-3:2006+A1:2007+A2:2010	Compliant
Immunity to near fields of wireless HF communication devices IEC 61000-4-3:2006+A1:2007+A2:2010	Compliant
Immunity to fast electrical transients/bursts – AC mains voltage IEC 61000-4-4:2012	Compliant
Immunity to electrical fast transients/bursts – I/O, SIP/SOP ports IEC 61000-4-4:2012	Compliant
Immunity to interference, surges IEC 61000-4-5:2005	Compliant
Immunity to conducted disturbances, induced by radio-frequency fields – AC mains voltage IEC 61000-4-6:2013	Compliant
Immunity to conducted disturbances, induced by radio-frequency fields – SIP/SOP ports IEC 61000-4-6:2013	Compliant
Immunity to power frequency magnetic fields IEC 61000-4-8:2009	Compliant

Electromagnetic compatibility (EMC) Interference immunity measurements	
Immunity to voltage dips, short interruptions and voltage variations IEC 61000-4-11:2004	Compliant

Immunity to interference table, near fields of wireless HF communication devices		
Radio service	**Frequency band MHz**	**Test level V/m**
TETRA 400	380 - 390	27
GMRS 460 FRS 460	430 - 470	28
LTE band 13, 17	704 - 787	9
GSM 800/900 TETRA 800 iDEN 820 CDMA 850 LTE band 5	800 - 960	28
GSM 1800 CDMA 1900 GSM 1900 DECT LTE band 1, 3, 4, 25 UMTS	1700 - 1990	28
Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE band 7	2400 - 2570	28
WLAN 802.11 a/n	5100 - 5800	9

Electromagnetic compatibility (EMC) Interference immunity measurements on the supply input	
Immunity to fast electrical transients/bursts – AC mains voltage IEC 61000-4-4:2012 ± 2 kV 100 kHz repetition rate	Compliant
Immunity to surges, line-to-line IEC 61000-4-5:2005 ± 0.5 kV, ± 1 kV	Compliant
Immunity to surges, line-earth IEC 61000-4-5:2005 ± 0.5 kV, ± 1 kV, ± 2 kV	Compliant

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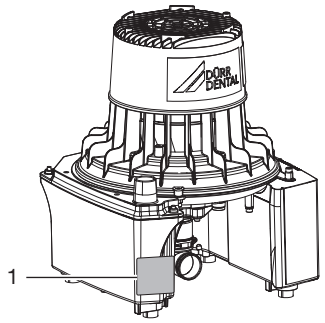
Electromagnetic compatibility (EMC) Interference immunity measurements on the supply input	
Immunity to conducted disturbances, induced by radio-frequency fields – AC mains voltage IEC 61000-4-6:2013 3 V 0.15–80 MHz 6 V ISM frequency bands 0.15–80 MHz 80% AM at 1 kHz	Compliant
Immunity to voltage dips, short interruptions and voltage variations IEC 61000-4-11:2004	Compliant
Electromagnetic compatibility (EMC) Interference immunity measurements SIP/SOP	
Immunity to electrostatic discharge IEC 61000-4-2:2008 ± 8 kV contact ± 2kV, ± 4 kV, ± 8 kV, ± 15 kV air	Compliant
Immunity to electrical fast transients/bursts – I/O, SIP/SOP ports IEC 61000-4-4:2012 ± 1 kV 100 kHz repetition rate	Compliant
Immunity to impulse voltages, conductor to earth IEC 61000-4-5:2005 ± 2 kV	
Immunity to conducted disturbances, induced by radio-frequency fields – SIP/SOP ports IEC 61000-4-6:2013 3 V 0.15–80 MHz 6 V ISM frequency bands 0.15–80 MHz 80% AM at 1 kHz	Compliant

4.4 Type plate

The type plate is is located on the noise reduction hood.



1 Type plate

4.5 Evaluation of conformity

This device has been subjected to conformity acceptance testing in accordance with the current relevant European Union guidelines. This equipment conforms to all relevant requirements.

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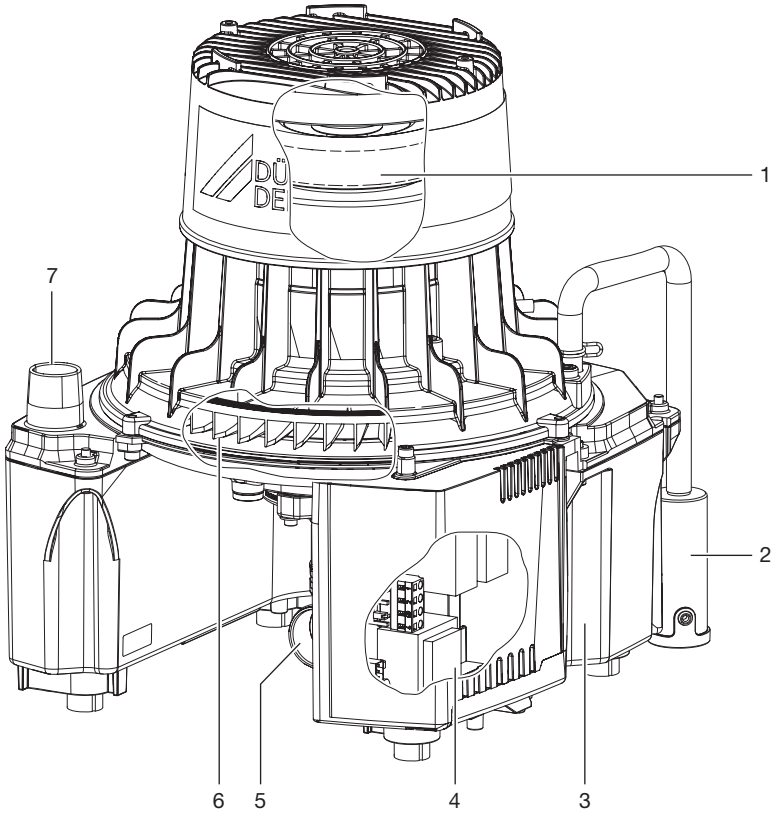
5 Operation

5.1 V 300 S



1 Motor
2 Auxiliary air nozzle
3 Exhaust air muffler
4 Control electronics
5 Suction connection
6 Turbine wheel
7 Exhaust air connection

The V-suction unit is suitable for use in dry air suction systems. The advantage of this system is that the suction units can be installed in any suitable room, regardless of the actual connection layout and routeing of the lines. The necessary air flow and vacuum are generated by a rapidly rotating impeller. An auxiliary air nozzle on the turbine housing protects the suction units against overheating.
When an appropriate vacuum for the machine is applied, approx. 300 l/min of air is sucked in through the suction cannula.
On the vacuum side the V-suction unit is equipped with a condensation separator that collects any condensation arising within the pipe system and transports it away to the outside.

The exhaust air from the suction unit should be guided out of the building (via the roof where possible). We recommended the installation of a bacteria filter in the exhaust air line. In addition, it is possible to install a noise-reducing muffler in the exhaust air line in order to reduce the amount of noise generated by the unit and by the air flow.

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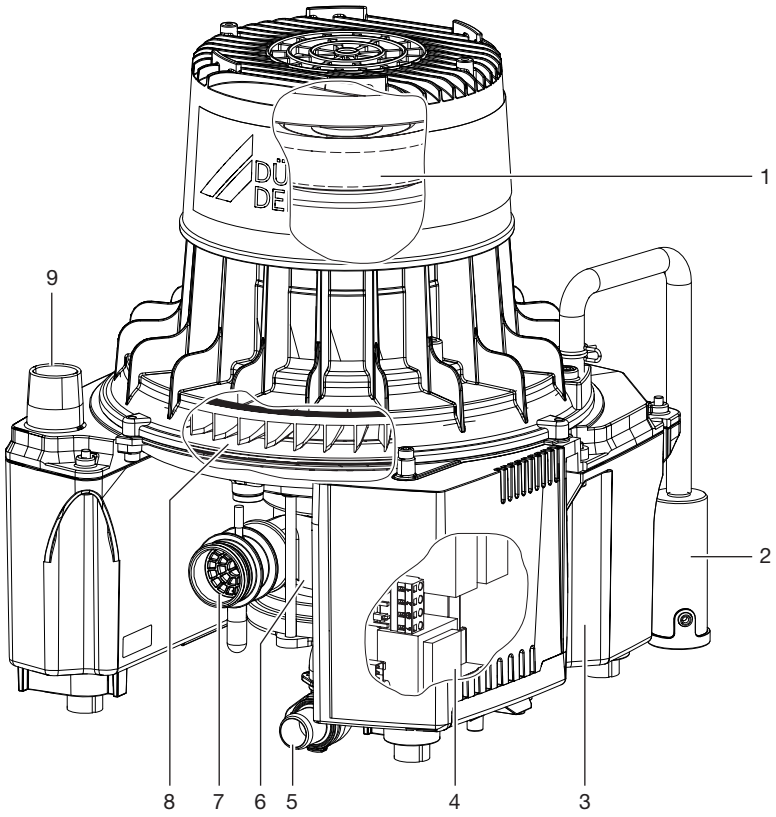
5.2 VS 300 S



1 Motor
2 Auxiliary air nozzle
3 Exhaust air muffler
4 Control electronics
5 Waste water connection
6 Separation
7 Suction connection
8 Turbine wheel
9 Exhaust air connection

The VS suction units are used in wet suction systems. The suction units can be installed on the same floor as the treatment units or on the floor underneath. The necessary air flow and vacuum are generated by a rapidly rotating impeller. An auxiliary air nozzle on the turbine housing protects the suction units against overheating.

When an appropriate vacuum for the machine is applied, approx. 300 l/min of air is sucked in through the suction cannula.

The impeller, the separation turbine and the waste water pump are driven by the motor.

The mixture of liquids, solid particles and air drawn in passes through the inlet connection and into the suction unit. The coarse filter holds back the solid particles.

Inside the separation unit, the aspirated fluids and solid particles pass through a two-stage separation system and are separated from the suction air. This separation system consists of a cyclone separator and a separation turbine. The suction process runs continuously.
The aspirated mixture flows into the cyclonic separator, where it is set into a spiral motion. In this first stage, the resulting centrifugal forces force the fluid constituents and any remaining solid particles against the outside wall of the separation chamber of the cyclone separator. This initially only effects a "coarse separation" of the fluid. In the subsequent second stage, the separation turbine effects "fine separation" of the remaining liquid from the air flow that has carried it to this point.
The waste water pump transports the liquid from the centrifuge together with the fine solid particles through the waste water connection into the central waste water network. A diaphragm valve is located in the waste water connection to prevent fluid from the drain being sucked back in.
The exhaust air from the suction unit should be guided out of the building (via the roof where possible). We recommended the installation of a bacteria filter in the exhaust air line. In addition, it is possible to install a noise-reducing muffler in the exhaust air line in order to reduce the amount of noise generated by the unit and by the air flow.

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Assembly

6 Requirements

Depending on the suction system, different installation options are available.

Further information can be found in our suction planning information leaflet. Order number9000-617-03/..

6.1 Installation/setup room

The room chosen for set up must fulfil the following requirements:

- Closed, dry, well-ventilated room
- Should not be a room made for another purpose (e. g. boiler room or wet cell)
- When installing in a cabinet the inlet and outlet ventilation slots must be present; minimum free cross-section at least 120 cm^2.
- Forced ventilation (fan) must be provided if there is a risk that the recommended room air temperature could be exceeded. The air flow performance must be at least 2 m^3/min.
- Do not cover cooling slots or openings with housing installations; ensure sufficient clearance to the openings to permit sufficient cooling.

6.2 Setup options

The following options for setting up the unit are available:

- Wall installation using a Dürr Dental wall mounting
- In a ventilated cabinet
- In a Dürr Dental noise reducing housing

6.3 Pipe materials

Only use vacuum-sealed HT-waste pipes manufactured from the following materials:

- Polypropylene (PP),
- Chlorinated polyvinyl chloride (PVC-C),
- Plasticizer-free polyvinyl chloride (PVC-U),
- Polyethylene (PE).

The following materials must not be used:

- Acrylonitrile-butadiene-styrene (ABS),
- Styrene copolymer blends (e.g. SAN + PVC).

6.4 Hose materials

For waste connections and suction lines only use the following hose types:

- Flexible spiral hoses made of PVC with integrated spiral or equivalent hoses
- Hoses that are resistant to dental disinfectants and chemicals

Plastic hoses will display signs of ageing over time. Therefore, they should be inspected regularly and replaced as necessary.

The following types of hoses must not be used:

- Rubber hoses
- Hoses made completely of PVC
- Hoses that are not sufficiently flexible

6.5 Information about electrical connections

› Ensure that electrical connections to the mains power supply are carried out in accordance with current valid national and local regulations and standards governing the installation of low voltage units in medical facilities.

› Install an all-pole disconnect switch with a contact opening width of at least 3 mm in the electrical connection to the mains power supply.

› Observe the current consumption of the devices that are to be connected.

Electrical fusing

LS switch 16 A, characteristic B, C and D in accordance with 60898.

6.6 Information about connecting cables

The diameter of the connections depends on the current consumption, length of line and the ambient temperature of the unit. Information concerning the current consumption can be found in the Technical Data supplied with the particular unit to be connected.

The following table lists the minimum diameters of the connections in relation to the current consumption:

Current consumption of unit [A]	Cross-section [mm^2]
> 10 and < 16	1.5
> 16 and < 25	2.5

Current consumption of unit [A]	Cross-section [mm²]
> 25 and < 32	4
> 32 and < 40	6
> 40 and < 50	10
> 50 and < 63	16

Mains supply cable

Installation type	Line layout (minimum requirements)
Fixed installation	– Plastic sheathed cable (e.g. type NYM-J)
Flexible	– PVC flexible line (e.g. H05 VV-F) or – Rubber connection (e.g. H05 RN-F or H05 RR-F)

Control cable

24 V protective low voltage for:
- Hose manifold
- Place selection valve
- Spittoon valve

Installation type	Line layout (minimum requirements)
Fixed installation	– Shielded sheathed cable (e.g. (N)YM (St)-J)
Flexible	– PVC data cable with shielded cable sheathing, as used for telecommunications and IT processing systems (e.g. type LiYCY) or – Lightweight PVC control cable with shielded cable sheathing

7 System components

The system components listed below are required or recommended for various procedures or for installation.

7.1 Rinsing unit

It is recommended that the suction system is equipped with a rinsing unit, e.g. in the treatment unit. The rinsing unit provides a small amount of water during aspiration. This dilutes the aspirated fluids (blood, saliva, rinsing water etc.), which can then be transported more effectively.

7.2 Flow accelerator

In order to keep the suction system free of deposits, a flow accelerator can be fitted in conjunction with a spittoon valve. When using a bowl rinse system, water will collect before the flow accelerator. The next time suction takes place using the large cannula, the collected fluid is transported in surges and at high speed to the suction system. This ensures automatic cleaning of the suction pipes.

7.3 Amalgam separator

The amalgam separator is designed to separate out and trap the heavy metal particles and amalgam dust that the suction unit aspirates from drilled fillings. The amalgam separator is installed in the drain behind the separation unit of the suction unit. The amount of fluid coming from the suction unit must not exceed the maximum permitted quantity of fluid that can be handled by the amalgam separator. Depending on the installation and on national regulations, a second amalgam separator may need to be installed.

7.4 Surge tank

If the suction unit is combined with an amalgam separator, this requires the installation of a surge tank. The surge tank reduces pressure peaks caused by the waste water pump of the suction unit and acts as a buffer against temporary rises in the volume of water.
The surge tank can also be used if the waste water is fed directly into the building waste water system. this case the waste water from the suction unit is diverted to the building drainage system under zero pressure.

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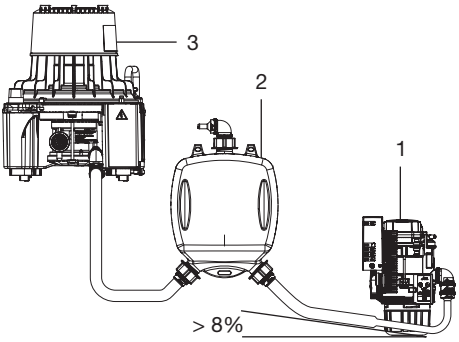


1 CA 1
2 Surge tank
3 VS 300 S combination suction unit

7.5 Bacteria filter

For hygienic reasons, we recommend the installation of a bacteria filter in the exhaust air line. If the unit is installed in the surgery and the exhaust air cannot be discharged to the outdoors, it is essential to install a bacteria filter. Depending on the type and condition of the bacteria filter, it will need to be replaced every 1-2 years at the latest.

The separation integrated in the system does not retain bacteria; this is why we recommend installing a suitable filter in the exhaust air system.

7.6 Noise reduction

If the noise level from the exhaust air vent or the flow noise generated is too high, noise reduction can be installed in the exhaust air line.

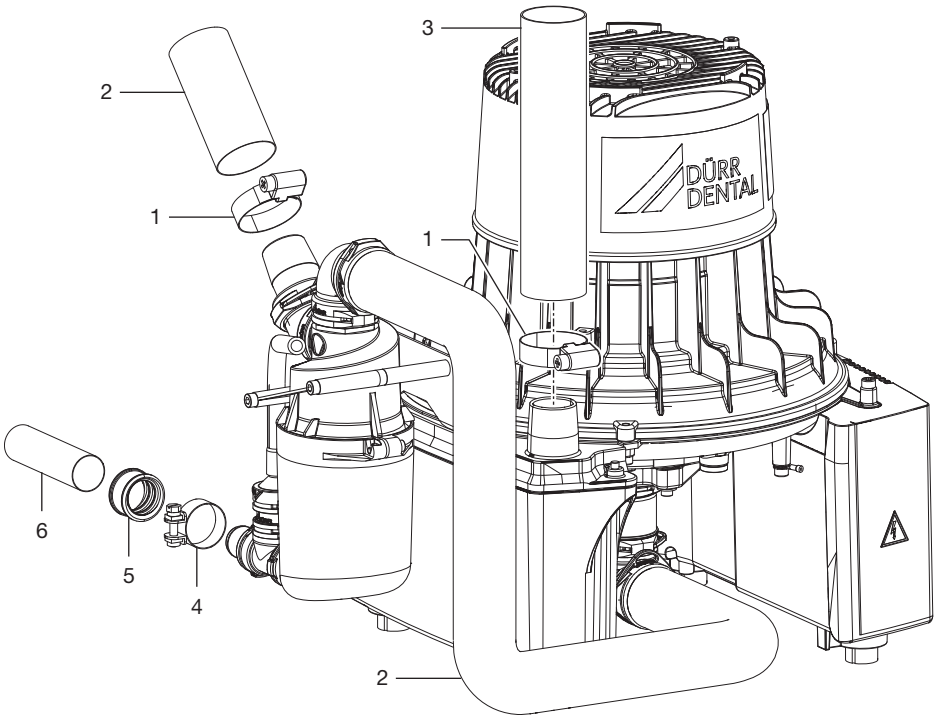
8 Installation

The actual connection can vary depending on the chosen installation option. The connection shown is only an example.

8.1 Installation and routeing of hoses and pipes

- Establish connections between the pipe system and the unit using the flexible hoses supplied. This will prevent vibrations from being transmitted to the pipe system.
- The connection between the pipe line and unit suction connection should be kept as short as possible and straight, without bends.
- Install the drain hoses with a downward gradient so that the waste water can drain off.
- Waste water connections must be implemented in accordance with applicable local and national regulations.

V 300 S



1 Hose clamp 25-40 mm
2 Suction hose ∅ 30 mm (internal)
3 Waste air pipe (aluminium)∅ 30 mm inside
4 Hose clip ∅ 28 mm
5 Hose sleeve
6 Waste water hose ∅ 20 mm (internal)

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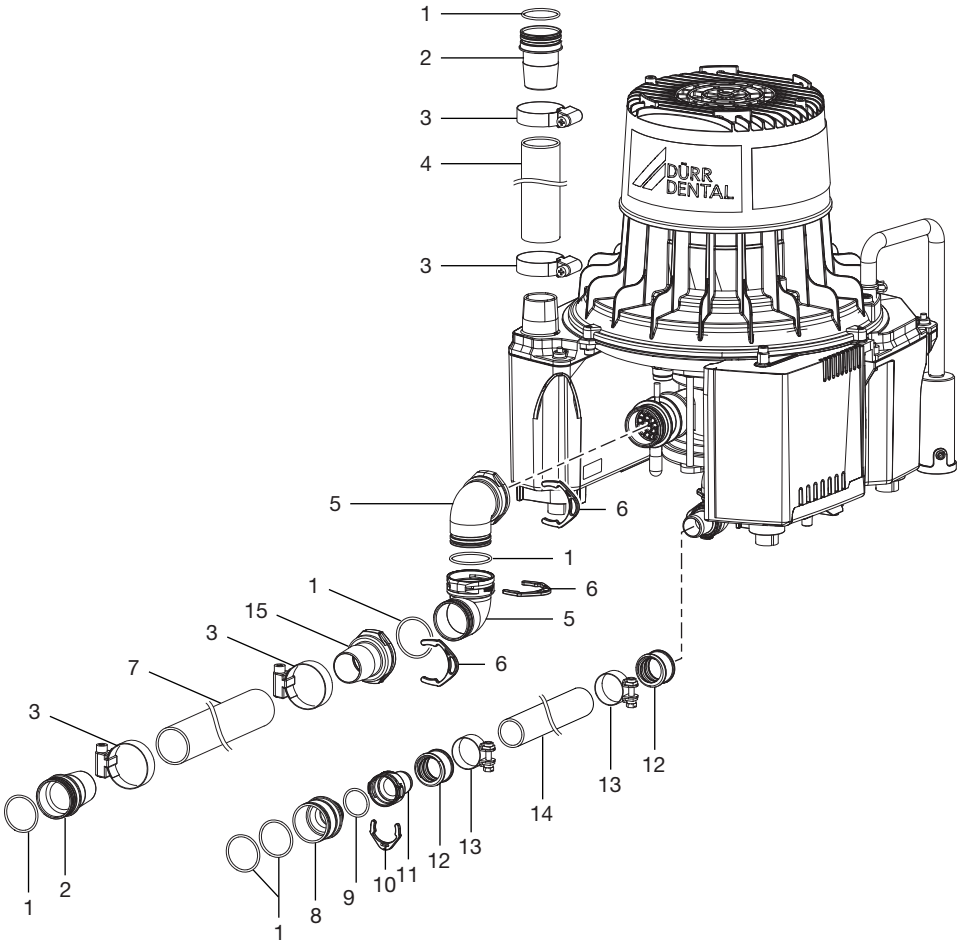
VS 300 S



1 O-ring ∅ 30x2 mm
2 Hose connector ∅ 30 mm
3 Hose clip 25-40 mm
4 Waste air pipe (aluminium)∅ 30 mm inside
5 Elbow DN 30
6 Securing ring
7 Suction hose ∅ 30 mm (internal)
8 Connector ∅ 36 mm (external)
9 O-ring ∅ 20x2 mm
10 Securing ring
11 Hose sleeve ∅ 20 mm
12 Hose sleeve
13 Hose clamp ∅ 28 mm
14 Waste water hose ∅ 20 mm (internal)

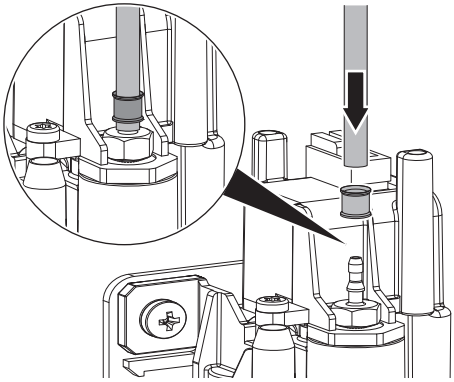
8.2 Rinsing unit water connections

Check the water pressure for the rinsing unit. The water pressure should be between 2 and 5 bar.

› Slide the clamping ring approx. 1.5 cm down the water hose.

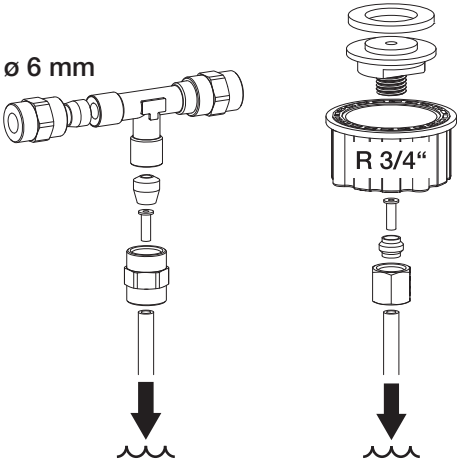
Dürr Dental recommends a water hose with an internal diameter of 2 mm; material: TPU, 87 Shore A, test certificate in accordance with German KTW ("contact with potable water") guideline.

› Plug the water hose onto the water connector.
› Use a suitable tool to slide the clamping ring to just before the end of the water hose.



› Attach the T-piece for water hose with ∅ 4 mm or ∅ 6 mm in the water supply.
› Attach the water hose with sleeve piece, clamping ring and locking nut to the T-piece.

› Alternatively, attach the water hose with adapter piece, seal, R3/4" screw connection, sleeve piece, double-tapered ring and locking nut to a water tap.



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9 Electrical connections

DANGER

Electric shock due to incorrectly connected device

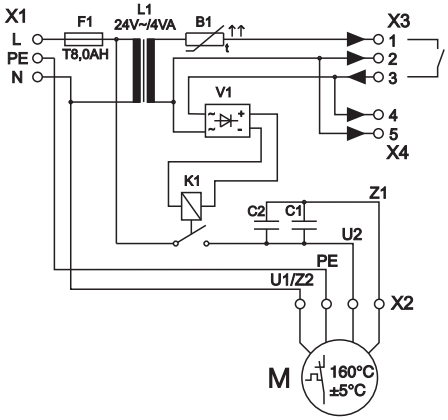
› Never install a mains plug instead of the fixed connection.

NOTICE

Short circuit due to defective lead

› Do not route wires near hot surfaces.

› Before connecting, check that the power supply voltage matches the voltage specifications on the type plate.
› Connect control line to control connection.
› Connect mains cable to mains connection.



X1 Mains connection
X2 Motor connection
X3 Control connection 24 V AC / max. 80 mA
X4 Control signal output 24 V AC / max. 20 mA

10 Commissioning

In many countries technical medical products and electrical devices are subject to regular checks at set intervals. The owner must be instructed accordingly.

› Turn on the unit power switch or the main surgery switch.
› Carry out a function check of the system.
› Check all connections for leak tightness.
› Carry out an electrical safety check in accordance with applicable regulations (e.g. regulations concerning set up, operation and application of medical devices) and record the results as appropriate, e.g. in the technical log book.
› Carry out and document the instruction and handover for the unit.

A sample handover report is included in the attachment.

Usage

11 Disinfection and cleaning

NOTICE

Device malfunctions or damage due to use of incorrect media

Guarantee claims may become invalid as a result.

› Do not use any foaming agents such as household cleaning agents or instrument disinfectants.
› Do not use abrasive cleaners.
› Do not use agents containing chlorine.
› Do not use any solvents like acetone.

Dürr Dental recommends
– For disinfection and cleaning:
  Orotol plus or Orotol ultra
– For cleaning:
  MD 555 cleaner

Only these products have been tested by Dürr Dental.
When using prophy powders, Dürr Dental recommends the water-soluble Lunos prophy powders in order to protect the Dürr Dental suction systems.

11.1 After every treatment

› Aspirate a glass of cold water through the large and the small suction hoses. Do this even if only the small suction hose was actually used during treatment.

Suction through the large suction hose causes a large amount of air to be drawn up, thereby considerably increasing the cleaning effect.

11.2 Daily after the end of treatment

After higher workloads before the midday break and in the evening

The following are required for disinfection/cleaning:
✓ Non-foaming disinfectant/cleaning agent that is compatible with the materials.
✓ Unit care system, e.g. OroCup
› To pre-clean, suck up 2 litres of water with the care system.
› Aspirate the disinfection/cleaning agent with the care system.

11.3 Once or twice a week before the midday break

Under harsher conditions (e.g. hard water or frequent use of prophy powders) 1x daily before the midday break

The following are required for cleaning:
✓ Special non-foaming detergent for suction units that is compatible with the materials.
✓ Unit care system, e.g. OroCup
› To pre-clean, suck up 2 litres of water with the care system.
› Aspirate the cleaning agent with the care system.
› Rinse with ca. 2 l water after the application time.

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12 VS 300 S

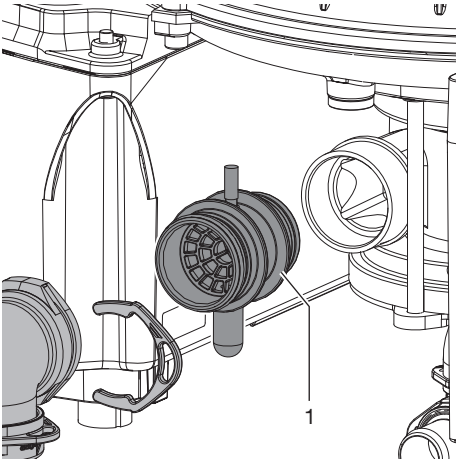
12.1 Cleaning the protective strainer

WARNING

Infection due to contaminated unit

- Clean and disinfect the suction before working on the unit.
- Wear protective equipment when working (e. g. impermeable gloves, protective goggles and mouth and nose protection).

- Pull off the suction hose from the protective strainer.
- Pull off any hoses connected to the connection piece on the protective strainer.
- Pull out the protective strainer from the connection piece on the separation housing.
- Clean the protective strainer.
- Push the protective strainer into the connection piece on the separation housing.
- Reconnect all hoses that have been pulled off.



1 Protective strainer

13 Maintenance

All maintenance work must be performed by a qualified expert or by one of our Service Technicians.

WARNING

Infection due to contaminated unit

- Clean and disinfect the suction before working on the unit.
- Wear protective equipment when working (e. g. impermeable gloves, protective goggles and mouth and nose protection).

Prior to working on the unit or in case of danger, disconnect it from the mains.

13.1 V 300 S

Maintenance interval	Maintenance work
Every 1-2 years	Replace the exhaust air filter (where fitted). *
Every 2 years	Check the waste valve on the condensation separator for correct operation and replace it if necessary. *

* Only to be done by service technicians.

13.2 VS 300 S

Maintenance interval	Maintenance work
Every 4 weeks	Check the protective strainer on the suction connection of the unit and clean or replace it as required.
Annually	Check the waste valve for correct operation and replace it if necessary. *
Every 1-2 years	Replace the exhaust air filter (where fitted).

* Only to be done by service technicians.

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Troubleshooting

14 Tips for operators and service technicians

Any repairs exceeding routine maintenance may only be carried out by qualified personnel or our service.

WARNING

Infection due to contaminated unit

- Clean and disinfect the suction before working on the unit.
- Wear protective equipment when working (e. g. impermeable gloves, protective goggles and mouth and nose protection).

Prior to working on the unit or in case of danger, disconnect it from the mains.

Error	Possible cause	Remedy
Device does not start	No mains voltage	› Check the mains voltage. * › Check the fuses and replace if necessary. *
	Undervoltage	› Measure the supply voltage; call an electrician if necessary. *
	No start signal	› Check the control voltage at the signal input. *
	Capacitor defective	› Measure capacitance and replace if necessary. *
	Turbine is blocked by solid particles or sticky soiling	› Disassemble the unit and clean the turbine. *
The unit generates unusual noises	Solid particles in the turbine chamber	› Disassemble the unit and clean the turbine and housing. *
Water leaking from the exhaust air connection	Membrane valve blocked	› Check the membrane valve at the waste water connection and if necessary clean or replace. *
	Foam in turbine due to use of incorrect cleaning and disinfectant agents	› Use non-foaming cleaning and disinfectant agents.
	Build-up of condensate in the exhaust air line	› Check the pipe system; avoid over-cooling. *
	Waste water line/siphon trap blocked	› Clean the waste water line/ siphon trap. *

Error	Possible cause	Remedy
Suction performance too low	Coarse filter blocked	› Clean the coarse filter at the intake connection.
	Leak in the suction line	› Check and if necessary establish leak-tightness of suction system and connections. *
	Mechanical sluggishness of turbine caused by soiling	› Disassemble the unit and clean the turbine. *

* Only to be done by service technicians.

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15 Transporting the unit

WARNING

Infection due to contaminated unit

› Disinfect the unit before transport.

› Close all media connections.

Wear protective equipment to avoid any risk of infection (e.g. liquid-tight protective gloves, protective goggles, face mask).

› Before disassembly, clean and disinfect the suction unit and the unit using a suitable disinfectant approved by Dürr Dental.

› Disinfect a defective unit using a suitable surface disinfection agent.

› Seal all connections with sealing caps.

› Pack the unit securely in preparation for transport.

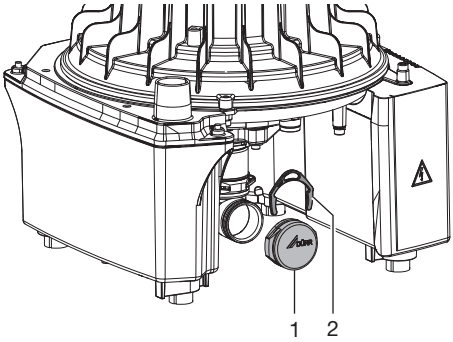

Fig. 3: V 300 S

1 Dummy bushing
2 Securing ring

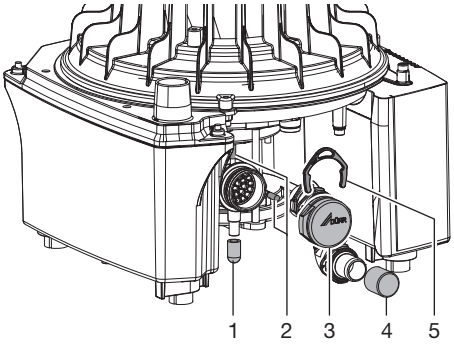

Fig. 4: VS 300 S

1 Auxiliary air connection sealing cap
2 Rinse connection sealing cap
3 Dummy bushing
4 Water outflow sealing cap
5 Securing ring

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Appendix

16 Handover record

This document confirms that a qualified handover of the medical device has taken place and that appropriate instructions have been provided for it. This must be carried out by a qualified adviser for the medical device, who will instruct you in the proper handling and operation of the medical device.

Product name	Order number (REF)	Serial number (SN)

- ☐ Visual inspection of the packaging for any damage
- ☐ Unpacking the medical device and checking for damage
- ☐ Confirmation of the completeness of the delivery
- ☐ Instruction in the proper handling and operation of the medical device based on the operating instructions

Notes:

Name of person receiving instruction: **Signature:**

Name and address of the qualified adviser for the medical device:

Date of handover:

Signature of the qualified adviser for the medical device:

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Hersteller/Manufacturer:

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